Migration Phenology Survey Protocol

Version 20160420; K. DuBour

The purpose of this survey is to document long-term changes in the timing (phenology) of spring migration of common bird species in the Upper Tanana Valley. The survey should begin every year in the last week of March and end during the first week of June. It should be done 3 days a week during this time period on Monday, Wednesday, and Friday.

Begin every survey at 8:30am.

Survey Equipment

- Binoculars
- Spotting scope and tripod
- Bird ID guide
- Smartphone or ipod with bird songs
- Stopwatch or timer
- GPS with waypoints (the route is called "Migration Phenology")
- Clipboard
- Protocol
- Reference Sheet
- Datasheets
- Camera (optional)

General Survey Instructions

The survey route consists of 18 distinct points located along the Alaska Highway and in Tanacross. **Stop at each point on the route EVERY time. Don't skip points unless the route is inaccessible (due to snow cover, etc.).** If the point is not accessible, make a note on the datasheet. Survey points in the order listed in this protocol.

One person should conduct the entire survey. A second person can record for the observer but should not record their own observations or alert the observer to any birds. If the observer does not detect a bird, that's OK. It's more important to include that bias in the data, than to detect every single bird at a point. However, having a recorder along is a great way for both of you to hone your birding skills. After the survey is done, discuss the survey together: "Did you hear a Swainson's thrush?", "do you think that raptor was a Harlan's hawk or a rough-legged hawk?," "how many juncos did you hear?" After discussion, the observer may alter the data on his/her datasheet but ONLY if s/he thinks it is warranted. Use your discretion. DO NOT change an observation unless you're confident in doing so.

Conducting the Survey

1. Leave the office around 8:20 am so that you can begin the survey at 8:30.
2. As you approach the count location, be aware of any birds that flush. If your presence removes birds from the count location, record those birds as if they were detected during the count period. For example, if you flush 12 mallards as you drive up to North Gravel Pit, record "MALL, 12, V" on your datasheet.
3. Stop the vehicle at or near the survey point and shut off the engine. Get out of the vehicle. Setup the tripod and spotting scope, if necessary. Record snow and/or ice cover, if applicable. Get your datasheet, pencil, binoculars and timer ready.
4. Wait quietly for 1-2 minutes.   Look and listen but **don't begin recording birds yet.** This brief period allows you to get a feel for the birds around you and allows birds to resettle after the noisy approach of your vehicle.
5. Start the stopwatch/timer and record the start time on your datasheet.
6. Look and listen. Record every bird you see and hear to an unlimited distance. Record birds as you detect them. As best as you can, try to keep track of individual birds. Try not to count birds twice (i.e., a warbler flitting around in the willows) or overestimate the size of a flock. If you do not detect any birds write "no birds detected" in big letters.
7. Stop after 5 minutes. You can spend up to 10 extra minutes recording individuals you detected during the count period but could not count (i.e, a large flock of duck on the ponds at Moon Lake Pullout). However, **DO NOT** record any new birds you hear or see during this period. If the bird is new or interesting, put it in the notes (e.g., "Scissor-tailed Flycatcher detected after the survey. Cool!")
8. Briefly review the data you recorded from that point, pack up your things and drive on to the next point.
9. If you make interesting observations anytime outside the 5-minute survey window, record those in the notes section.

Recording Data

Survey Reference Sheet
The Survey Reference Sheet is located in *<T:\Biology\Birds_General\Migration Phenology Survey\Protocol>.* This sheet contains reference information needed to fill out the datasheet, including:

- classification codes and descriptions for Observer Experience, Beaufort Wind Speed and Ice Cover, Bird Species and Bird Behavior
- a cheatsheet for visual estimation of cloud, snow and ice cover

Survey Data Sheet
Blank datasheets are located at *<T:\Biology\Birds_General\Migration Phenology Survey\Datasheets>.* Use additional datasheets for each survey, if necessary.

Observer & Weather Data
- Date – record today's date in MM/DD/YYY format

- Observer name and experience ranking – if you are conducting the survey, write your full name. Rank your experience level according to the scale on the Reference Sheet.
- Recorder name and experience ranking – if you are not conducting the survey but will be recording data for the observer, write your full name and experience ranking. Also, write your name here if you are recording for yourself (a single person conducting the survey).
- Start time – time that the survey began, on the 24-hour clock (e.g., 2:00pm = 14:00). This should be recorded at the Tetlin Office site
- End time – time that the survey ended, on the 24-hour clock. This should be recorded at the Tanana River Bridge site.
- Start temperature – air temperature (in ºF) at the start of the survey. This should be recorded at the Tetlin Office site
- End temperature - air temperature (in ºF) at the end of the survey. This should be recorded at the Tanana River Bridge site
- Start cloud cover – estimated percent cover of clouds in the sky at the start of the survey, in increments of 5%. See Reference Sheet for a cheatsheet to help visually estimate this. This should be recorded at the Tetlin Office site.
- End cloud cover – estimated percent cover of clouds in the sky at the end of the survey, in increments of 5%. See Reference Sheet for a cheatsheet to help visually estimate this. This should be recorded at the Tanana River Bridge site
- Start Beaufort wind speed – wind speed code at the start of the survey using the Beaufort scale (see Reference Sheet). This should be recorded at the Tetlin Office site.
- End Beaufort wind speed - wind speed code at the end of the survey using the Beaufort scale (see Reference Sheet). This should be recorded at the Tanana River Bridge site
- Start wind direction – circle the approximate cardinal direction that the wind is blowing (N, NE, E, SE, S, SW, W or NW), as indicated by a weather vane, for example, at the start of the survey. If wind speed = 0, do not record wind direction. This should be recorded at the Tetlin Office site.
- Start wind direction – circle the approximate cardinal direction that the wind is blowing (N, NE, E, SE, S, SW, W or NW), as indicated by a weather vane, for example, at the end of the survey. If wind speed = 0, do not record wind direction. This should be recorded at the Tanana River Bridge site.

Count Data

- Location – write the count location name here
- Start time –start time of count on the 24-hour clock
- End time – end time of the count on the 24-hour clock
- % snow cover – visually estimate percentage of snow cover on the ground within a 100m radius circle of the count point to within 5%. See Reference Sheet for a figure to help visually estimate this. Do this only at Brinkman's Field, Pump Station East, Tanacross Airstrip and Musher's Hall. For all other points, cross this field out.
- Ice cover code – Estimate the degree of breakup on the waterbody. Use the ice cover codes and descriptions on the Reference Sheet.
- % ice cover - visually estimate percentage of ice cover on the waterbody (gravel pit pond, lake or river) to within 5%. Do not include skim ice (very thin, glass-like ice that forms in open water

during the cold nights) in your estimate. See Reference Sheet for a figure to help visually estimate this. Do this only at Tanacross River at Tanacross East, South Gravel Pit, North Gravel Pit, Moon Lake West, Ugly Pit and Tanana River Bridge.

- Species – four-letter species code of the bird(s) detected. See Reference Sheet. If you do not know the four-letter code, write the entire species name. If you're unsure of the species, write what you know: do you know it was a sparrow, but it flew away before you could determine what species? Write "unknown sparrow". Get as specific as you can: if you know the bird was a duck, write "UNDU (Unknown Duck)", if you know it was a dabbling duck , write "DIVER (DIVER Species)", if you know it was a scaup, write "SCAUP (Scaup Species)", etc. However, **DO NOT GUESS.** You can always write "UNBI (Unknown Bird)".
- # - record the number of individuals of that species for each detection. Do not group all species together if they are detected at different times. For example, if you hear a junco singing early in the count, record "SCJU, 1, S". Then, if you another later in the count, do not add it to your first observation. Write "SCJU, 1, S" again. However, if you detect multiple individuals at the same time, record them together. For example, if you hear 3 juncos singing simultaneously, record "SCJU, 3, S". Similarly, count flocks of birds together "MALL, 12, V". Flocks of birds that flyover might be recorded like this: "TRUS, 150, F/O", "TRUS, 42, F/O", "TRUS, 55, F/O".
- Behavior – record the behavior as the bird when you **first** detected it. For example, if you hear Wilson's warbler calling but have to find it to identify it, record the observation as "WIWA, 1, C" even though you had to see it visually to identify it. However, all birds flying through the location (i.e., not using the habitat within the location) should be recorded as F/O (flyover), regardless of how they were first detected. For example, you hear a flock of cranes and find 50 of them flying over on the horizon, record them as "SACR, 50, F/O", even though you first detected them calling (C). See Reference Sheet for behavior codes and descriptions.
- Confidence level – your confidence in your detection, recorded as a percent. If you are not 100% sure that you identified the bird correctly, that's OK. Just record your confidence level in that observation. For example, if you get a quick glimpse of an accipiter flying fast through the trees, you might think "it was too big for a sharp-shinned hawk and it was very gray colored. I'm pretty sure it was a goshawk but I didn't get a good enough look at it to be sure", record the observation as "NOGO, 1, V, 80%". You can also make a note about what you saw and why you recorded the observation this way in "Notes". If you are 100% confident in your observation, put a "---" through this column. Again, **DO NOT GUESS, record what you know.**
- Notes – record anything noteworthy here: birds detected before or after the count or between count locations, excessive noise that impacted your ability to hear, other wildlife observed, etc.

Special Circumstances

Weather
- Do not conduct the survey in poor weather conditions (i.e., rain, extreme wind, fog). If possible, conduct the survey the next day. If you cannot conduct a survey, fill out the top portion of a datasheet, with your name, weather, etc. In the notes, write why the survey was not conducted.
- If poor weather conditions interrupt the survey after you have begun you should 1) wait for the weather to pass if you think it will pass within 30 minutes or 2) discontinue the survey. In this

case, record why the survey was discontinued. Resume the survey the next day at the location you left off.

- If you cannot conduct a count at a location, fill in as much of the top portion of the data sheet as you can, including location, time, ice and snow cover (if applicable). Record information about why the count was not conducted. Continue conducting the survey at the next location
- Chainsaws, trucks, chatty people and other noises affect your ability to detect birds. If a noise interrupts your count, pause your timer (and your count) until the noise passes, then restart. Do not record birds during this period. Alternatively, you can restart the count but be sure to erase the birds you detected during the aborted count period.

Estimating Flock Size

Estimating the size of a group of birds can be tricky, especially when the flock is moving. On this survey, you're most likely to encounter groups of swans or cranes flying over. But you'll also see large groups of ducks sitting on ponds and swallow overhead.

If you're able to count every individual bird, do that. Setup your scope and start making tick marks on your datasheet. However, if birds are moving and your time window is short, estimate the size of the flock by counting a subgroup of birds, then count in increments. In the figure below, we can count the first group of ten birds to get an idea of the proportion of the flock those birds take up, then extrapolate by tens for the rest of the flock. We get 110 birds using this method. The actual flock size is 118. This isn't perfect, but it's a good estimate. For more information, see
http://ebird.org/content/ebird/news/counting-101/

Figure 1. Crested auklets in flight. Credit http://ebird.org/content/ebird/news/counting-101/

Using Bird Guides

You may use a bird guide and recorded bird songs to help you identify birds. However, do not use the guide during the count period. Wait until the 5-minute count is over, then you may spend additional time using the guide to identify the bird. You may amend observations on your datasheet based on what you learned from the guide but be careful that you do not allow the guide to convince you of an identification. A guide can be a great way to check that the LBDO you saw was not a SBDO, for example, but should not be used to

Rare Species

If you observe a rare species, spend additional time identifying the bird. Get a visual, take notes, draw sketches and, most importantly, **take photos.** Get as much documentation as possible and get a second observer to confirm your observation. Make a staff member aware of your observation at the office so that we can properly report it.

Back at the Office

After you've finished the survey and returned to the office:

1. Check your data. Look over your datasheet to make sure it's complete and accurate. Check your bird codes, fill in missing fields and, if you forgot to record some data, indicate that too.
2. Scan your datasheets. Scan a copy of your datasheet and save it in *<T:\Biology\Birds_General\Migration Phenology Survey\Datasheets\Scanned Field Datasheets\YEAR>.* Name the file *< FieldDataSheets_YYYYMMDD.pdf>,* where YYYYMMDD is the year, month and day that the survey was conducted.
3. Write your initials and date in the top right corner the original datasheet under "Scanned and Saved by/Date". Put the original datasheet in the manila folder labelled "Completed Phenology Datasheets" on the file cabinet.

Entering Data

Data should be entered at the end of the season into an Access database. The database is located in *<T:\Biology\Birds_General\Migration Phenology Survey\Database>*

Appendices

Appendix 1: Survey points

#	Location	Description	Waypoint	Lat	Long	Use Scope	Snow Cover	Ice Cover	Weather
1	Tetlin Office	Flag pole in front of Tetlin office	MIG01	63.32376	-143.03958				X
2	Brinkman's Field	Field on N side of Alaska Hwy, MP 1318.8	MIG02	63.34679	-143.13664	X	X		
3	Pump Station East	N onto Pump Station Rd at MP 1321; in open field at corner of fencing, beneath powerlines	MIG03	63.35542	-143.20324		X		
4	Pump Station West	Go W along the fenceline, then NW to clearing near old banding station and at base of steep hill; often old firepits here.	MIG04	63.36084	-143.21214		X		
5	Tanana River at Tanacross West	Tanacross boatlaunch, east side	MIG05	63.37824	-143.34814	X			
6	Tanana River at Tanacross East	Intersection of Tanana River and Tanacross Airstrip, at crosses on riverbank	MIG06	63.37924	-143.34402	X		X	
7	Tanacross Airstrip	Tanacross Airport Road; gravel driveway NW of buildings at corner of paved portion, marked with pink flagging	MIG07	63.37254	-143.34203	X	X		
8	South Gravel Pit	Old gravel pit at Alaska Hwy MP 1327, S side of road	MIG08	63.36293	-143.40692	X		X	
9	North Gravel Pit	Old gravel pit at Alaska Hwy MP 1327, N side of road	MIG09	63.36415	-143.41647	X		X	
10	Muskeg MP 1329	Alaska Hwy MP 1329	MIG10	63.36302	-143.46088				
11	Moon Lake West	Moon Lake Recreation Area, W side on edge of lake by boatlaunch and firepit	MIG11	63.37620	-143.54519	X		X	
12	Moon Lake East	Moon Lake Recreation Area, E side on edge of lake between campsites 13 & 14	MIG12	63.37584	-143.54067	X			
13	Moon Lake Pullout	Not really a pullout anymore. Alaska Hwy MP 1330.1 on N side	MIG13	63.36066	-143.49558	X			
14	Tanacross Burn MP 1326.8	Alaska Hwy MP 1326.8; power pole #11448	MIG15	63.36312	-143.39278				
15	Musher's Hall	Parking area at the Tok Dog Musher's Association Hall; E side of building at Alaska Hwy MP 1312.7	MIG16	63.33177	-142.94113		X		
16	Tok River Campground	Tok River Recreation Area at MP 1309.3; in RV parking, by large rock in front of restrooms	MIG17	63.32524	-142.83274				
17	Ugly Pit	Old gravel pit on N side of Alaska Hwy at MP 1306.5; on SE edge of pit near intersection with powerline corridor	MIG18	63.31933	-142.74645	X		X	
18	Tanana River Bridge	Rest area on N side of Alaska Hwy on the Tanana River, MP 1303.5; N of boatlaunch, follow riverside trail about 40m for view of bridge and cliffs on opposite bank	MIG19	63.31790	-142.65002	X		X	X

Appendix 3: Reference Sheet

Tetlin NWR Migration Phenology Reference Sheet

Observer Experience

Code	Description
1	No previous experience; do not know how to identify most species
2	Some previous experience and feel comfortable identifying species with <50% accuracy
3	Some previous experience and feel comfortable identifying species with 50%-90% accuracy
4	Lots of previous experience and feel comfortable identifying the species with >90% accuracy

Beaufort Wind Speed

Code	Description	Speed (mph)
0	Smoke rises vertically	<1
1	Wind direction shown by smoke drift	1-3
2	Wind felt on face; leaves rustle	4-7
3	Leaves, small twigs in constant motion; light flag extended	8-12
4	Raises dust and loose paper; small branches are moved	13-18
5	Small trees in leaf sway; crested wavelets on inland waters	19-24

Ice Cover

Code	Description
B0	No sign of break up
B1	Open water on shore
B2	Open water offshore
B3	Ice in movement
B4	Final breakup

Estimate ice cover in increments of 5%

Bird Behavior

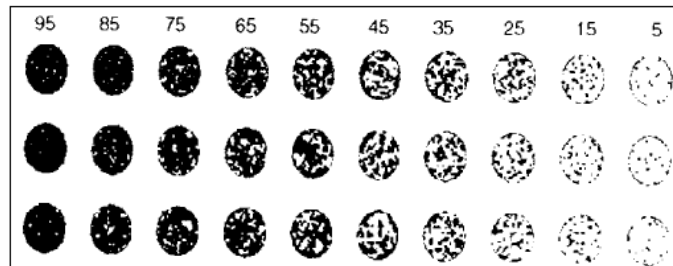| Code	Behavior
S	Singing
C	Calling
V	Visual
F/O	Flyover – flying bird not actively using the habitat within the area (e.g., flying in a straight line over the survey area)
D	Drumming (woodpecker or grouse)
FD	Flight display (shorebirds)

95 85 75 65 55 45 35 25 15 5

Figure 1. Use this cheatsheet to help visually estimate % cover of clouds, snow and ice.

Updated April 27, 2016 by Kristin DuBour
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Survey\Protocol\MigrationPhenologySurveyReferenceSheet_20160421.docx

Species names and associated four-letter codes. Species with problematic codes that are often recorded incorrectly are highlighted in yellow.

Code	Species Name	Code	Species Name
AGWT	American Green-winged Teal	CORA	Common Raven
ALFL	Alder Flycatcher	CORE	Common Redpoll
AMDI	American Dipper	COYE	Common Yellowthroat
AMGP	American Golden-plover	DABBLER	Dabbler species
AMKE	American Kestral	DIVER	Diver species
AMPI	American Pipit	DOWO	Downy Woodpecker
AMRO	American Robin	EUWI	Eurasian Widgeon
AMWI	American Widgeon	FOSP	Fox Sparrow
ARTE	Arctic Tern	GADW	Gadwall
ARWA	Arctic Warbler	GCKI	Golden-crowned Kinglet
ATSP	American Tree Sparrow	GCRF	Gray-crowned Rosy-finch
BAEA	Bald Eagle	GCSP	Golden-crowned Sparrow
BAGO	Barrow's Goldeneye	GCTH	Gray-cheeked Thrush
BANS	Bank Swallow	GGOW	Great Gray Owl
BASA	Baird's Sandpiper	GHOW	Great Horned Owl
BBMA	Black-billed Magpie	GOEA	Golden Eagle
BBPL	Black-bellied Plover	GRAJ	Gray Jay
BBWO	Black-backed Woodpecker	GRSC	Greater Scaup
BCCH	Black-capped Chickadee	GRYE	Greater Yellowlegs
BEKI	Belted Kingfisher	GWCS	Gambell's White-crowned Sparrow
BLPW	Blackpoll Warbler	GWFG	Greater White-fronted Goose
BLSC	Black Scoter	GWGU	Glaucous-winged Gull
BOCH	Boreal Chickadee	GYRF	Gyrfalcon
BOGU	Bonaparte's Gull	HADU	Harlequin Duck
BOOW	Boreal Owl	HAFL	Hammond's Flycatcher
BOWA	Bohemian Waxwing	HAHA	Harlans Hawk
BRCR	Brown Creeper	HAWO	Hairy Woodpecker
BUFF	Bufflehead	HERG	Herring Gull
BWTE	Blue-winged Teal	HETH	Hermit Thrush
CANG	Canada Goose	HOGR	Horned Grebe
CANV	Canvasback	HOLA	Horned Lark
CBCH	Chestnut-backed Chickadee	HORE	Hoary Redpoll
CHSP	Chipping Sparrow	HUGO	Hudsonian Godwit
CITE	Cinnamon Teal	KILL	Killdeer
CLSW	Cliff Swallow	LALO	Laplund Longspur
COGO	Common Goldeneye	LBDO	Long-billed Dowitcher
COLO	Common Loon	LEFL	Least Flycatcher
COME	Common Merganser	LESA	Least Sandpiper

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Survey\Protocol\MigrationPhenologySurveyReferenceSheet_20160421.docx

Appendix 4: Example Datasheet

Left sheet:

Entered by/Date: _____   Checked by/Date: _____   Scanned and Saved by/Date: _KAD 5/16/16_

Tetlin NWR Migration Phenology Survey Datasheet

Date: _5/16/16_

Observer name: _Kristin DuBour_   Experience Ranking: _4_

Recorder name: _Hannah Banana_   Experience Ranking: _2_

Weather	Start (Tetlin Office Site)	End (Tanana River Bridge Site)
Time (24 hour)	8:30	14:42
Temperature (°F)	53	65
Cloud Cover (in increments of 5%)	25	50
Beaufort Wind Speed	2	2
Wind Direction (circle)	N NE E SE S SW (W) NW	N NE E SE S SW W (NW)

****

Location: _Tetlin Office_   Start Time: _8:32_ End Time: _8:37_

% Snow Cover*: _____   Ice Cover Code**: _____   % Ice Cover**: _____

Species	#	Behavior	Confidence (if <100%)	Species	#	Behavior	Confidence (if <100%)
SCJU	2	V					
MERL	1	F/O	80				
RCKI	1	S					
AMRO	2	C					
MYWA	1	S					
SWANspp	18	F/O					

*Brinkman's Field, Pump Station East, Tanacross Airstrip and Musher's Hall ONLY
**Tanacross River at Tanacross East, South Gravel Pit, North Gravel Pit, Moon Lake West, Ugly Pit and Tanana River Bridge ONLY

Notes: _loud generator noise._
MERL flying overhead; back lit

Wood Frogs Detected _O_

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Right sheet:

Date: _5/16/16_   Observer: _KAD_

Location: _Brinkman's Field_   Start Time: _8:52_   End Time: _8:57_

% Snow Cover*: _20_   Ice Cover Code**: _____   % Ice Cover**: _____

Species	#	Behavior	Confidence (if <100%)	Species	#	Behavior	Confidence (if <100%)
RUGR	1	D					
TRUS	152	F/O					
SAVS	1	S					
SAVS	2	C					
TRES	8	V					
NSHR	1	F/O	75				
MYWA	1	S					
SAVS	1	S					
WISN	1	WI					

*Brinkman's Field, Pump Station East, Tanacross Airstrip and Musher's Hall ONLY
**Tanacross River at Tanacross East, South Gravel Pit, North Gravel Pit, Moon Lake West, Ugly Pit and Tanana River Bridge ONLY

Notes:
iris blooming
NSHR flying fast; quick look

Wood Frogs Detected _O_

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Location: _South Gravel Pit_   Start Time: _14:07_   End Time: _14:12_

% Snow Cover*: _____   Ice Cover Code**: _B3_   % Ice Cover**: _40_

Species	#	Behavior	Confidence (if <100%)	Species	#	Behavior	Confidence (if <100%)
No Birds							
Detected							

*Brinkman's Field, Pump Station East, Tanacross Airstrip and Musher's Hall ONLY
**Tanacross River at Tanacross East, South Gravel Pit, North Gravel Pit, Moon Lake West, Ugly Pit and Tanana River Bridge ONLY

Notes:

Wood Frogs Detected _5_